The Origin of Phase Separation

- Self assembly of nanometer-sized features is one of the critical processes necessary to control in order to make devices for optoelectronic and quantum computing applications a reality.
- We examine the initiation mechanisms and self assembly of phase separated regions in compound semiconductors, which develop by both morphological (Fig. 1) and compositional (Fig. 2) variations. These features develop a lateral correlation length as the thickness increases that is equal to the modulation wavelength observed using TEM.
- *Submitted to Physical Review Letters*

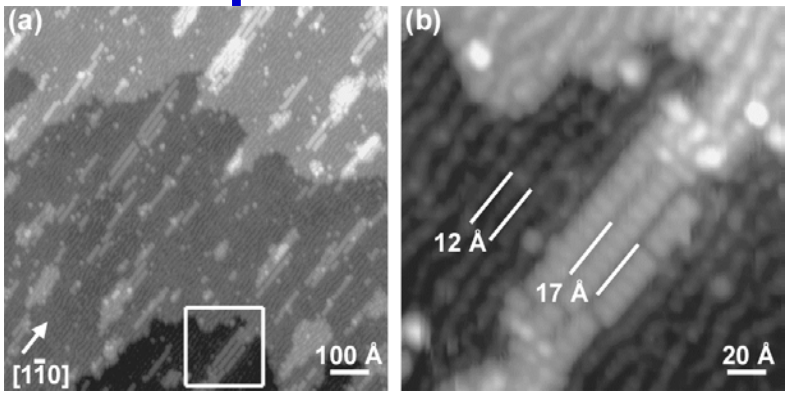

Figure 1: Scanning Tunneling Micrograph (STM) of an InAs terminated multilayer with In-rich islands decorating the surface. Here the composition modulation develops as a result of a morphological variation

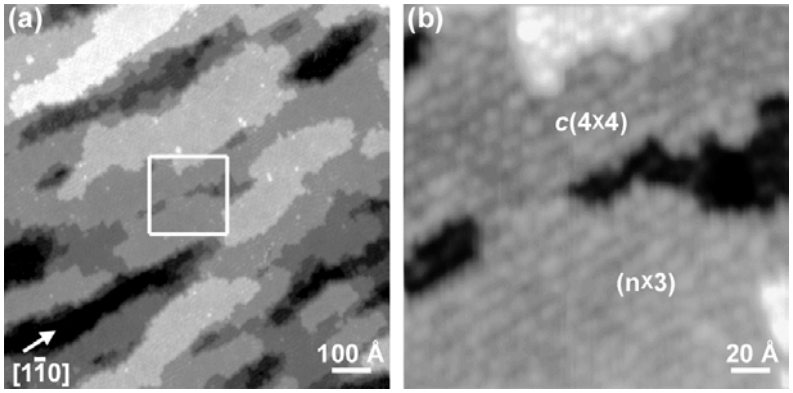

Figure 2: STM GaAs-terminated multilayer. The mesas have various reconstructions present, suggesting a variation in the composition within the layer

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